

What is Claimed is:

1. An antenna comprising:  
a conductive bottom member;  
a conductive side member; and  
a conductive member arranged in a space surrounded by  
the bottom member and the side member,  
wherein the conductive member is connected to a signal  
line for transmission and/or reception.
2. The antenna according to claim 1, wherein the bottom member  
is grounded as a ground conductor.
3. The antenna according to claim 1, wherein the bottom member  
has a feeding point on a surface thereof.
4. The antenna according to claim 1 or 3, wherein the  
conductive member and the bottom member are connected to each  
other in a place other than the signal line or the feeding  
point.
5. The antenna according to claim 1, wherein the conductive  
member and the side member are connected to each other.
6. The antenna according to claim 1, further comprising:  
a conductive ceiling member covering all or part of the  
space.
7. The antenna according to claim 6, wherein the conductive  
member and the ceiling member are connected to each other  
electrically and/or mechanically.

8. The antenna according to claim 6, wherein the ceiling member and the side member are connected to each other electrically.

9. The antenna according to claim 6, wherein the ceiling member has a periphery having a curved shape.

10. The antenna according to claim 1, wherein the bottom member and/or the side member have openings.

11. The antenna according to claim 6, wherein the ceiling member has openings.

12. The antenna according to claim 10 or 11, wherein the openings have means of adjusting their size.

13. The antenna according to claim 11, wherein, if it is assumed that a projection of the conductive member onto the bottom member is an origin point and the bottom member is arranged in an X-Y plane, the bottom member and the side member are symmetric with respect to a Z-Y plane, and the openings are symmetrically arranged with respect to a Z-Y plane.

14. The antenna according to claim 13, wherein the bottom member and the side member are symmetric with respect to a Z-X plane, and the openings are symmetrically arranged with respect to a Z-X plane.

15. The antenna according to claim 1 or 6, comprising a dielectric member that has a permittivity higher than air and is provided in the space.

16. The antenna according to claim 15, wherein the dielectric member is provided at least so as to cover a part of the space which is not covered with the ceiling conductor.

17. The antenna according to claim 15, wherein the dielectric member fills the entire inside of the space.

18. The antenna according to claim 17, wherein the dielectric member has a via hole, and the side member consists of the via hole.

19. The antenna according to claim 1 or 6, further comprising at least one matching element which is arranged apart by a predetermined distance from the conductive member, wherein the matching element and the bottom member are connected to each other electrically.

20. The antenna according to claim 19, wherein at least one of the matching elements is electrically connected to the conductive member.

21. The antenna according to claim 19, wherein at least one of the matching elements is electrically connected to the ceiling member and/or the side member.

22. An arrangement method of antennas that is an arrangement method of the antennas according to claim 1, comprising a step of aligning and arranging the plural antennas in a manner to conform a direction for minimizing directivity of each of the antennas on a horizontal plane.

23. An antenna device comprising:

the antenna according to claim 1 or 6; and all or part of a circuit for transmission and/or reception which is connected to the signal line while being arranged in the space.

24. The antenna device according to claim 23, further comprising a shielding member of covering all or part of the circuit, wherein the shielding member does not contact to the conductive member electrically.

25. The antenna device according to claim 24, wherein the shielding member is formed as a concave portion that is each part of the bottom member and/or the side member; and

wherein all or part of the circuit is arranged in the concave portion.

26. The antenna device according to claim 25, further comprising a lid member which covers the concave portion and stores all or part of the circuit, wherein the lid member is electrically connected to the bottom member and/or the side member.

27. The antenna device according to claim 23, wherein the circuit is constituted with a passive circuit.

28. The antenna device according to claim 23, wherein an active element is contained in the circuit.

29. The antenna device according to claim 23, wherein a microwave circuit is contained in the circuit.

30. The antenna device according to claim 23, wherein an optical passive element is contained in the circuit.

31. The antenna device according to claim 23, wherein an optical active element is contained in the circuit.

32. The antenna device according to claim 23, wherein the circuit has an IC.

33. The antenna device according to claim 23, wherein the circuit has such size that the circuit is hidden behind the ceiling member, when viewing the antenna device from the ceiling member side in the direction perpendicularly to the ceiling member.

34. An array antenna device that is an array antenna device where the plural antenna devices according to claim 23 are arrayed, wherein the circuits in the plural antenna devices each input or output the same signal.

35. The array antenna device according to claim 23, wherein the circuit has a cartridge form so as to be detachable from the antenna.

36. The antenna device according to claim 23, wherein the circuit comprises plural sub-circuits having radio systems different from each other, and switching means of switching the connection between anyone of the sub-circuits and the antenna.

37. The antenna device according to claim 23, wherein the circuit is arranged in the position that hides the circuit behind the ceiling member, when viewing the antenna device from the ceiling member side in the direction perpendicularly to the ceiling member.

38. The antenna device according to claim 23, wherein the circuit comprises: amplification means of amplifying the signal for the transmission and/or reception; and frequency selection means of selecting a frequency of the signal for transmission or the signal for reception.

39. A radio equipment comprising the antenna device according to any one of claims 23, and a power supply circuit provided in the circuit.